



Impact of Social Determinants on Health Outcomes

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Sources of funding: None.

Abstract

The Centers for Disease Control and Prevention (CDC) defines the social determinants of health (SDOH) as "the nonmedical factors that influence health outcomes." Outside of the hospital, these are the environments where people are born, grow up, and engage in their daily lives, which are heavily impacted by a wider set of forces such as socioeconomic policies, racism, and climate change. The most frequently identified social risk domains are food insecurity, housing instability, and transportation difficulties. Strikingly, clinical care affects only 20% of the county-level variation in health outcomes, while SDOH affects as much as 50%. This association is most salient for preventable diseases such as obesity, diabetes, cardiovascular disease, and stroke. The United States consistently scores poorly in overall health outcomes associated with socioeconomic factors compared to other high-income and middle-income countries. Several research findings indicate increased response rates when patients are inquired about their SDOH through a written questionnaire instead of verbal inquiries. Strategies to tackle this issue involve the establishment of food pharmacies, prescription programs, and facilitating connections between patients and various agencies. These efforts aim to secure stable and safe housing for individuals and provide non-emergency medical transportation services for their appointments. SDOH can be a huge barrier to physical and mental well-being. Addressing SDOH requires mindfulness that one size does not fit all in medicine.

What are Social Determinants of Health (SDOH)

"Doc, I have only 3 dollars. Should I buy food or medicine?" one patient asked me with tears. Another patient had to be readmitted three times to the emergency room as she had no transport to dialysis from her home. The key point affecting these patients' lives and health outcomes is the social determinant of health (SDOH). The Centers for Disease Control and Prevention (CDC) defined SDOH as "the nonmedical factors that influence health outcomes. They are the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life.

These forces and systems include economic policies and systems, development agendas, social norms, social policies, racism, climate change, and political systems.¹ The United States Department of Health and Human Services (HHS) report on April 1, 2022, stated that clinical care affects only 20% of the county-level

variation in health outcomes, while SDOH affects as much as 50%.² When compared to other high-income and middle-income countries, the United States consistently scores poorly in overall health outcomes in association with socioeconomic factors.³ In particular, the association between socioeconomic status and health outcomes is salient for preventable diseases where the cause of death is under greater human control since personal resources can be mobilized to attain health-relevant knowledge and services.⁴ These include diabetes, obesity, stroke, and cardiac diseases, which are interrelated and among the leading causes of death. For instance, researchers have found that those with a higher cumulative social disadvantage experienced a nearly threefold increased risk of all-cause and cardiovascular mortality.⁵ In addition, there is a Black-White difference in cardiovascular mortality with 484.7 deaths versus 384.5 deaths per 100,000 person-years.⁶ Of note, this disparity was eliminated once adjusted for SDOH. Within the research on the social determinants of health, Fundamental Cause Theory has emerged as a prominent framework for explaining how health disparities emerge and persist

due to social factors. In simpler terms, Link and Phelan's theory states that our social conditions, like how much money we have or our race and gender, can affect our health in different ways. This happens because certain important resources for a healthy life, such as access to healthcare or safe places to live and work, are not equally available to everyone. Even if we improve one aspect, health inequalities can persist because the underlying causes continue to impact different aspects of our lives. Fundamental Cause Theory seeks to understand how social inequalities create circumstances that disproportionately place certain populations at higher risks of adverse health outcomes.³ Dr. Golden provides an example of how overarching fundamental causes, such as racism, cause disparities in cardiometabolic outcomes in the United States.^{7,8} The history of inadequate investment to maintain public works and school systems in minoritized neighborhoods, as well as discrimination in access to high-quality jobs with health insurance, has contributed to structural and institutional racism. At the local level, this presents poor access to healthy food, safe and open spaces to exercise, affordable housing, and difficulty accessing medical care. Within hospitals, this manifests as increased overall stress and an increased risk of hypertension, hyperglycemia, and obesity.

Reasons to Screen for SDOH

Despite the accepted knowledge that SDOH are linked to adverse health outcomes, increased healthcare utilization, and hospital readmissions, more than two-thirds of hospitals did not screen for social risk factors to identify individual-level adverse SDOH.^{2,3}

The National Academies of Sciences, Engineering, and Medicine have recommended incorporating SDOH data into electronic health records (EHRs) to enhance social and medical care integration, from research to care delivery.^{9,10} In healthcare settings, both documenting and reviewing SDOH data in EHRs are vital components of this integration, leading EHR vendors and health systems to introduce dedicated fields for structured SDOH data capture. These fields differ from previous methods where social risk factors were mixed with clinical needs in EHR documentation. Despite the growing interest in SDOH and the rapid expansion of SDOH documentation tools in EHRs, there is no consensus on how various types of EHR fields should be used to capture SDOH data.¹⁰ Evaluating

the impact of different approaches on achieving comprehensive documentation is crucial as we experiment with EHR-based SDOH documentation in various healthcare settings. A limited number of studies have assessed the extent to which specific social risk factors are documented in EHRs using different field types. For instance, one study found that social risk factors like housing instability and poor social support were more likely to be recorded in physician clinical notes rather than in structured problem lists and health maintenance registries in the EHR.¹¹ While these studies provide valuable insights into EHR-based SDOH documentation, they lack a universally applicable set of measures to compare different EHR-based SDOH documentation options. Measuring the use of new EHR SDOH fields and comparing their utilization to existing fields containing SDOH data can inform efforts to enhance EHR integration strategies. There is no standard method for screening for social needs as of now. SDOH screening needs to be cognizant of the fear and stigma that patients may experience in disclosing social risk factors. For instance, one study found a higher response rate when social screening was done via a questionnaire rather than verbally.¹² In a natural experiment at one clinic, clinicians originally verbally asked for a 2-item food insecurity questionnaire to parents before switching to a written form. This shift led to an immediate and significant increase in the proportion of families who reported food insecurity. Furthermore, when screened anonymously, families are more likely to disclose food insecurity or other social risk factors. If not executed appropriately, screenings may lead to concerns about how the data will be used, fear of being referred to child protective services, and mistrust in the healthcare system. There are many multidomain social risk screening tools available, but few have undergone reliability and validity testing.¹³ The most frequently identified social risk domains were food insecurity, housing instability, and transportation difficulties. A comprehensive review of social risk screening tools found that 36% used an observational design with no comparator and only 18% of studies randomized controlled trials. A few studies empirically testing the efficacy of specific social screening tools are promising. The Columbus Ohio Public Health Department developed Core⁵, which consists of five questions written at a fifth-grade reading level in patient-friendly language.³ Pilot studies for the Core⁵ social risk screening demonstrated high staff usability, increases in social support referrals for patients, and documented reliability in measuring SDOH. A small study implementing this in a surgical clinic supported these findings. In addition, the WellRx questionnaire has demonstrated success in pilot programs in identifying at-risk patients with multiple social needs and appropriately connecting them to social services.²

Interventions to Address SDOH

Once patients have been properly screened, hospitals are then tasked with providing or connecting them to the necessary social services. This encompasses multiple domains, but the focus will be on the top 3 concerns: food insecurity, housing instability, and transportation difficulties. These measures have been shown to improve patient health outcomes and reduce cost expenditures. Having access to healthy foods enables people to follow healthy diets, which translates into improved outcomes. Efforts to address this include food pharmacies, food prescription programs, and home-delivered meals covered by insurance or healthcare agencies such as Medicaid. A study conducted at Geisinger Health Systems found that diabetic patients who were prescribed five days of breakfast and dinner ingredients per week at their Fresh Food Farmacy had a 20% decline in HbA1c levels.³ Furthermore, every percentage point decline in HbA1c levels was correlated with saving \$8,000 in healthcare costs. Similarly, Medicaid beneficiaries who participated in food delivery programs had fewer emergency department visits, fewer inpatient visits with shorter stays, and significantly reduced healthcare spending. Safe and affordable housing is similarly associated with a plethora of positive health outcomes and reduced health expenditures. A study in Chicago compared individuals with chronic medical illnesses and experiencing homelessness who received housing and case intervention to those who received usual care.² Results showed 2.6 fewer hospitalized days, 1.2 fewer ED visits, 7.5 fewer days in residential substance use disorder treatment, and 9.8 fewer nursing home days in the interventional group. Additionally, they had an estimated annual cost savings of \$6,307 compared to the control group, accounting for healthcare, legal, housing, and case management costs. Furthermore, measures to improve household quality are key to improving health outcomes.

An intervention that provided dust mite covers, professional house cleaning, and roach bait and trays to households of children with asthma found that the intervention group had lower dust mite levels and better functional severity scores compared to a delayed intervention group.² Another study found that such interventions resulted in a median reduction of 21 symptom days per year and 0.57 asthma acute care visits annually among children. Around 3.6 million people in the U.S. miss medical services due to transportation

issues per year. Connecting patients to services such as non-emergency medical transportation has been essential for patients receiving dialysis, chemotherapy, radiation therapy, diabetic wound care, and substance use disorder. One study found that 58% of respondents in this patient population would not be able to attend their treatment appointments without this service provided by Medicaid.^{2,3} Furthermore, this saved \$3,423 in costs for dialysis patients and \$792 in costs for wound care patients. On the other hand, a clinical trial in Philadelphia showed that providing rideshare services to Medicaid patients led to no significant difference in the number of missed appointments compared to a control.¹⁴ Researchers found that other factors such as stress, inability to take time off work, and the need to be a caregiver for family members ultimately posed a larger threat to their ability to attend appointments.

Healthcare is a basic right of all human beings. SDOH can be a huge barrier to physical and mental well-being. Addressing SDOH requires mindfulness that one size does not fit all in medicine. We require more randomized clinical trials reporting health outcomes from SDOH screening and essential interventions to steer their widespread integration into healthcare.

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